



Fatigue & Performance



Naval Safety Center
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What Is Fatigue?



A physiological state in which your mental capacity is diminished. It results when you haven't gotten enough sleep or when your sleep has been disturbed.

What Causes It?



- Chronic sleep deprivation (sleep debt)
- Shift work
- Time-zone travel
- Disrupted Circadian rhythms
- Impaired sleep efficiency
- Life-style choices.

Negative Effects



Fatigue produces broad declines in multiple measures of performance:

- ❑ Mood and motivation
- ❑ High-level cognition, decision making, multitasking and situational awareness
- ❑ Basic reaction times and vigilance
- ❑ The brain's awake state also becomes unstable: lapses and microsleeps interrupt performance.

Health Problems



Chronic sleep deficiencies and fatigue are associated with multiple health problems, including:

- high blood pressure
- stress
- weight gain
- metabolic impairment
- depressed immune system function
- diabetes
- heart problems.

Fatigue as a Mishap Cause



- Majority of mishaps (80-85%) are caused by “human factors” errors; many are fatigue-related
- Fatigue is one of the top sources of hour-to-hour variance and unpredictability in human performance.

Fatigue Is Often Not Recognized



- Under-recognized as a mishap causal factor.
- No measurement tools for fatigue.
- Culture is averse to recognition. Fatigue often masquerades as complacency, inattention, distraction, task-fixation, or boredom.
- Fatigued people have a hard time recognizing their own fatigue and assessing its impact on performance.

Controlling Fatigue



Requires:

- ✓ Command climate and policies conducive to getting enough sleep.
- ✓ Intelligent scheduling and mission planning.
- ✓ Application of effective countermeasures to control fatigue and limit risk in fatigued individuals.
- ✓ Individual education and awareness.

Fatigue Physiology

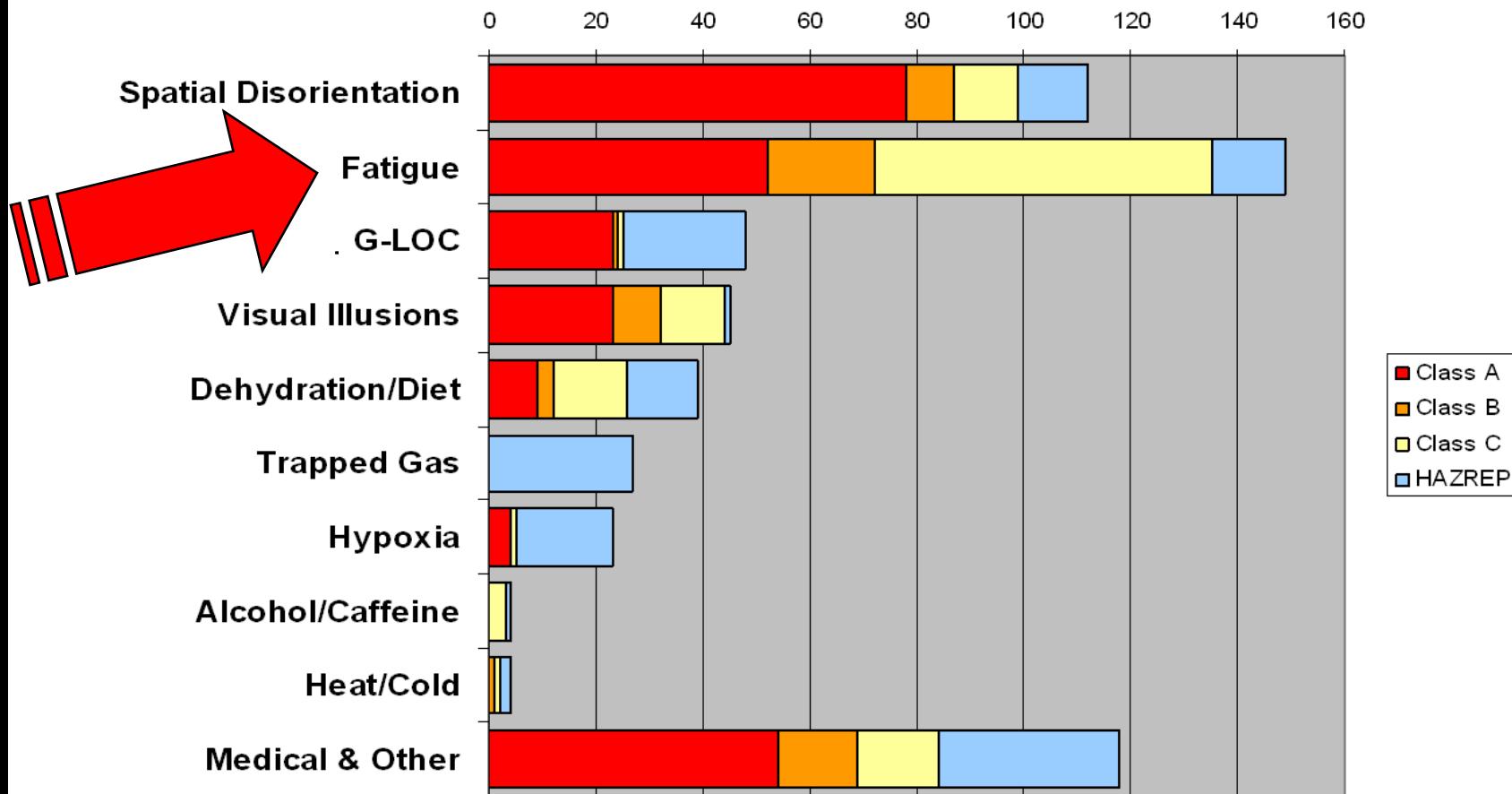


Computer modeling of human fatigue physiology has recently proved feasible.

This gives us the first tool to predict, quantify and control the effects of fatigue.

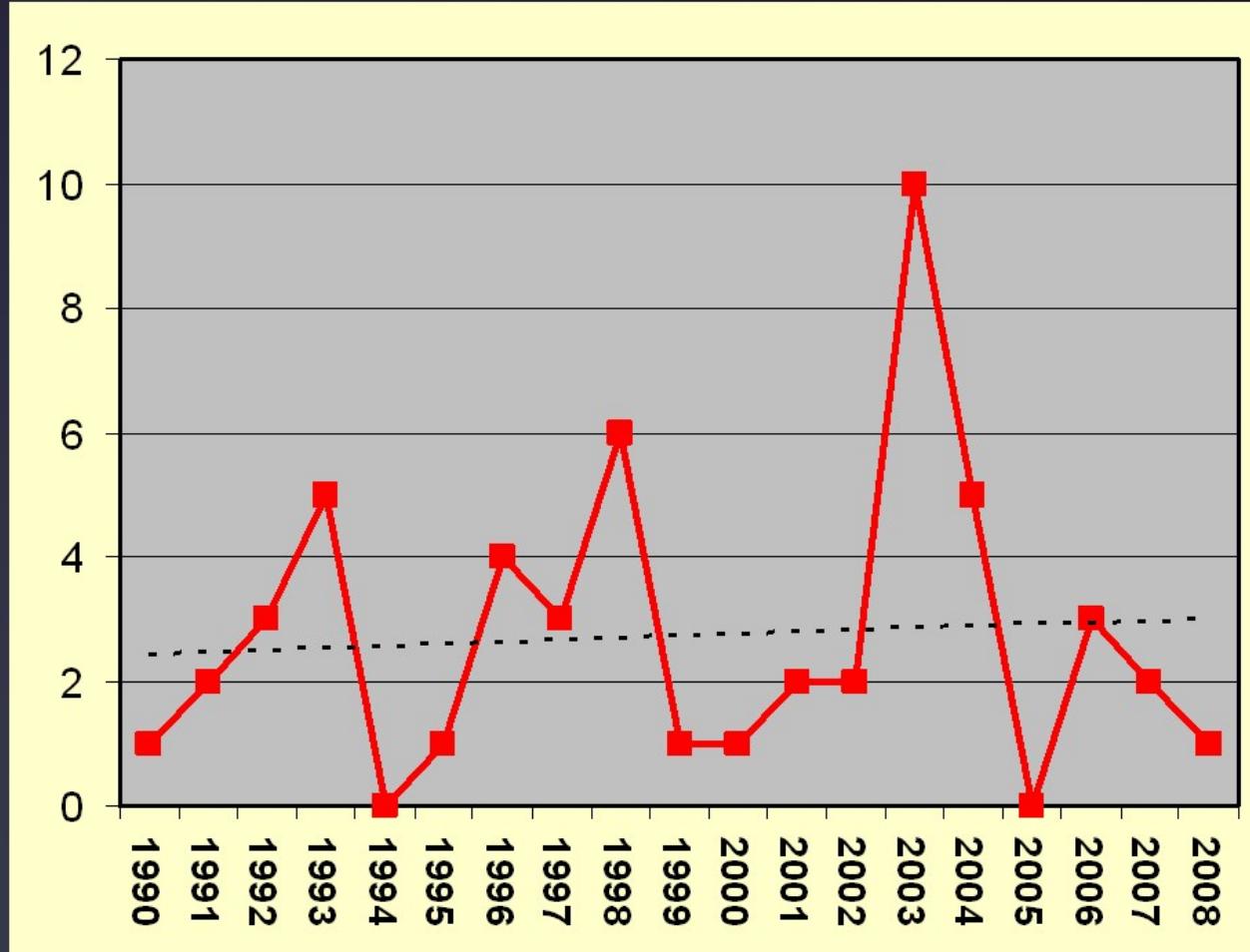
Aeromedical “Why” Causal Factors

Reported in Mishaps & HAZREPS



CAPT N. Davenport; NAVSAFECEN data from Mr. John Scott; FY's 1990-2008

Fatigue Class A Mishap “Why” Factors, by Year



- Fatigue, Sleep Deprivation
- Fatigue, Other Acute & Chronic
- Fatigue, Circadian Rhythm Disruption
- Fatigue, Motivation/ Burnout

Effects



Inadequate sleep, even just one night, can:

- ➔ affect your mood and emotions (you can become short-tempered, depressed, anxious)
- ➔ interfere with your memory
- ➔ reduce your ability to make good decisions
- ➔ make it harder for you to concentrate
- ➔ make you more sensitive to pain

Symptoms of Fatigued Driving



- Involuntarily closing your eyes
- Yawning
- Letting your car drift back and forth in your lane
- Having a hard time paying attention
- Reacting more slowly than normal
- Paying less attention to road signs, road changes, actions of other drivers

Drivers Ages 18 to 29 Are Most At Risk

- Prone to getting less sleep
- Lots of extracurricular activities
- Late night socializing
- Poor sleep habits



The “Witching Hour”



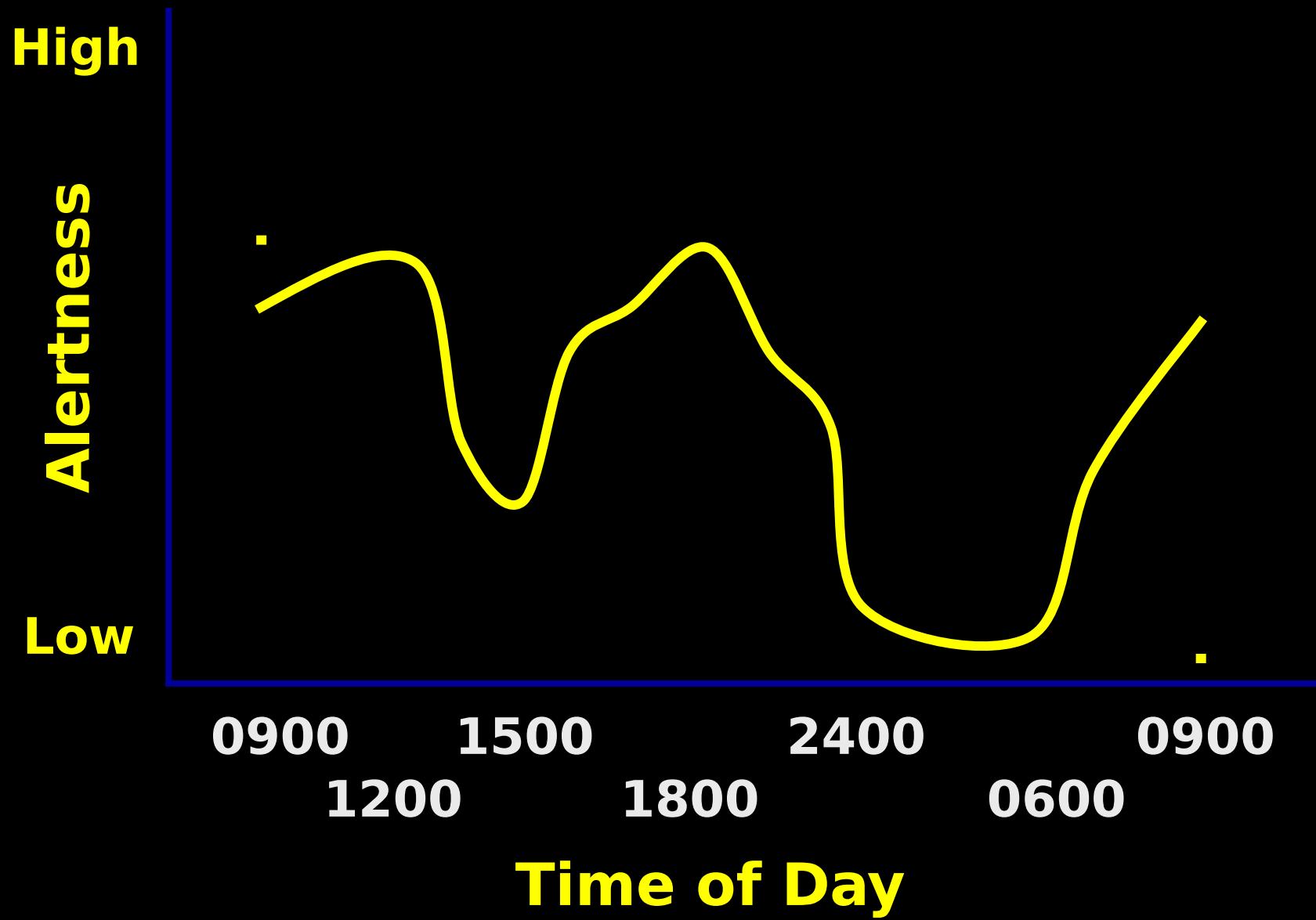
- There is a strong relationship between time of day and traffic accidents.
- The most dangerous time is between 2400 and 0600.

Watch the Clock



- Time of day is a much better predictor of decreased driving performance than continual hours of driving.
- You are more likely to get into a wreck when it is in the time period when you are normally resting as compared to working long hours or driving long hours

When Fatigue



What Can You Do?



- Exercise vigorously, such as 2-minute bursts of running in place, jumping jacks, straight up and down jumps
- This will temporarily charge your system and overcome sleepiness
- Drink two cups of coffee, wait 20 minutes, and then drive.
- If you are the passenger, talk to the driver to help him or her keep focused and to assess their condition

Note: These alternatives aren't as good as sleep.

What *Doesn't* Work



- Rolling down the window
- Listening to loud music on the radio or CD player
- Taking off your shoes
- Eating a snack
- Splashing cold water on your face

Fatigue Quiz



Test your knowledge of fatigue with the following questions.

Click for answer.

Coffee can help overcome the effects of drowsiness while driving? (T or F)



- Answer: **True**, but be careful. Caffeine takes 20-30 minutes to take effect, and although it helps you with alertness it is by no means a substitute for rest. Also, once you get home it takes a couple of hours to subside in the system so if you need to go to sleep immediately when you get home, this may cut down on your rest for the next day.

You can tell when you're going to go to sleep. (T or F)



- Answer: **False**. Sleep is not voluntary. If you're drowsy, you can fall asleep and never even know it. When you wake up, you can't tell how long you've been asleep.

I'm a safe driver, so it doesn't matter if I'm sleepy. (T or F)



- Answer: **False**. The only safe driver is an alert driver. Even the safest drivers become confused and use poor judgment when they are sleepy or fatigued.

You can “stockpile” sleep on the weekends. (T or F)



- Answer: **False**. Sleep is not money. You can't save it up ahead of time and you can't borrow it. But, just as with money, you can go in debt.

Most adults need at least 7 hours of sleep each night.

(T or F)



- Answer: **True**. The average person needs seven or eight hours of sleep per night. If you go to bed late and wake up early to an alarm clock, you probably are building a sleep debt.

Being sleepy makes you misperceive things (T or F)



- Answer: **True**. One of the warning signs of a drowsy driver is misjudging surroundings.

Young drivers can get by on less sleep because their stamina and physical condition. (T or F)

- Answer: **False**. Young people need more sleep than adults. Males under 25 are at the greatest risk of falling asleep. Half of the victims fatigued-related crashes are under 25.



Wandering, disconnected thoughts are warning signs of driver fatigue. (T or F)



- Answer: **True**. If you are driving and your thoughts begin to wander, it is time to pull over and take a break or let someone else in the car take over the wheel.